Claims

What is claimed is

1. An isolated nucleic acid comprising a nucleotide sequence or a fragment thereof encoding the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:3.

2. The nucleic acid of Claim 1, wherein said nucleotide sequence comprises the nucleotide sequence set forth in SEQ ID NO:2 or SEQ ID NO:4 or a fragment thereof of at least 18 base pairs up to the full length of the open reading frame encoding said amino acid sequence.

3. The nucleic acid of Claim 2, wherein said fragment is between 18 and 500 base pairs.

4. A nucleic acid fragment that hybridizes to SEQ ID NO:2 or SEQ ID NO:4 under stringent hybridization conditions and has other than a nucleotide sequence as shown in Figure 2.

5. The nucleic acid fragment of Claim 4, wherein the fragment contains a label for detection selected from the group consisting of a radioisotope, an enzyme, a particle and a protein.

6. An antibody that binds specifically to the amino acid sequence or portion thereof set forth in SEQ ID NO:1 or SEQ ID NO:3.

7. The antibody of Claim 6 wherein said antibody is polyclonal.

8. The antibody of Claim 7 wherein said antibody is monoclonal.

9. An isolated nucleic acid construct comprising a transcriptional initiation sequence operably linked to SEQ NO:2 or SEQ NO:4.

10. A recombinant vector comprising the nucleic acid construct of Claim 9.

11. The vector of Claim 10 wherein, SEQ NO:2 or SEQ NO:4 is operably linked in a sense orientation with respect to said transcriptional initiation sequence.

12. The transcriptional initiation sequence of Claim 9, wherein said initiation sequence provides wound induced expression of SEQ NO:2 or SEQ NO:4.

13. A transgenic plant cell or bacterial cell comprising the vector of Claim 11.

14. A degenerate primer pair based on Phenylalanine ammonia-lyase homologous sequences in closely related plants, wherein first primer of said paired primers is GAYCCNYTNAAYTGGGG and second primer of said paired primers is CCYTGRAARTTNCCNCCRTG.

15. A method of producing a transgenic cell having altered phenylalanine ammonia-lyase levels, said method comprising

introducing an expression cassette comprising a transcription initiation sequence operably linked to an open reading frame coding for SEQ ID NO:1 or SEQ ID NO:3 or an enzymatically active fragment thereof, and,

growing said cell whereby said open reading frame is expressed and a cell having altered phenylalanine ammonia-lyase is produced.

16. The method of Claim 15, wherein open reading frame is shown in SEQ ID NO:2 or SEQ ID NO:4.

17. The method of Claim 16, wherein expression of said open reading frame results in an increase in an activity selected from the group consisting of antifungal, antibacterial and insecticidal activity.

18. A method for measuring the relative amount of phenylalanine ammonia-lyase levels in a tissue, said method comprising:

contacting said tissue with antibodies specific for the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:3, and;

comprising a detectable label wherein a change in the intensity of said detectable label in said tissue as compared to a control tissue is indicative of an increase or decrease of phenylalanine ammonia-lyase in said tissue.

19. The method of Claim 19, wherein said antibodies are polyclonal.

20. The method of Claim 20, wherein said antibodies are monoclonal.

21. A kit for measuring phenylalanine ammonia-lyase protein levels in an article of produce, comprising:

antibodies specific for the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:3 or a particle thereof.

22. Antibodies specific for the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:3 or a particle thereof, wherein said antibodies are polyclonal.

24. Antibodies specific for the amino acid sequence set forth in SEQ ID NO:1 or SEQ ID NO:3 or a particle thereof, wherein said antibodies are monoclonal.